# Army Digitization Operational Impacts

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## Abstract

This paper will analyze the current and near term state of digitization within the United States Army. It will review the current operational capabilities of the Army Battlefield Command Systems (ABCS) as well as the major weapon systems. The role of the Digital Force Coordination Cell (DFCC) is defined as well as the overall effort the Army is making to coordinate the introduction of new and radical different Information Age material on its Doctrine, Organization, Training, Logistic, Leadership and Personnel.

The Army has committed to changing its basic command and control process though the introduction of capabilities of technologies promised in the Information Age. These promises included the ability to have vastly better Situational Awareness (SA). The term SA has been defined to mean the knowledge of where you are on the battlefield, where your friends are, where the enemy are and what environmental concerns you need to contend with. The Army is convinced that the future battlefield will be one which SA will spell the difference between a war of attrition like that in the last century and one that is determined very quickly perhaps even without bloodshed or if bloody then very short and decisive.

The Army has already begun to change the basic organizational structure of its current active duty divisions and its combat service support structures. As the software releases of the ABCS and its companion system hardware and software of the Future Battlefield Command and Control Brigade and Below  (FBCB2) are fielded to the First Digital Division, 4th Infantry at Fort Hood, Texas in October 2000 the Army will have entered the Information Age.  New communications systems and weapon systems will support these command and control systems. Over 70 priority one systems, necessary for minimum capability will be fielded to units at Fort Hood.

This paper will describe the impact of these news systems on the operational and tactical levels of war. It will provide a brief description of the systems and then provided lessons learned from real life applications of the new technologies. Finally it will project the impact on the objective systems on the operational Army. This paper will provide a view of what is now and what is likely to be the impacts of the ABCS and FBCB2 systems on the Army of the Information Age. It will review the impact of the new weapon systems that are improved by the Command and Control systems. It will also describe the communications systems that will support both the weapon systems and the command and control systems.

## Report Documentation Page

| 1. REPORT DATE **JUN 1999** | 2. REPORT TYPE | 3. DATES COVERED **00-00-1999 to 00-00-1999** |
|---|---|---|

| 4. TITLE AND SUBTITLE **Army Digitization Operational Impacts** | 5a. CONTRACT NUMBER |
|---|---|
| | 5b. GRANT NUMBER |
| | 5c. PROGRAM ELEMENT NUMBER |
| 6. AUTHOR(S) | 5d. PROJECT NUMBER |
| | 5e. TASK NUMBER |
| | 5f. WORK UNIT NUMBER |

| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **MITRE Corporation,ATTN: AFZF-DFCC,Bldg 1001, Rm 316W,Fort Hood,TX,76544** | 8. PERFORMING ORGANIZATION REPORT NUMBER |
|---|---|

| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) | 10. SPONSOR/MONITOR'S ACRONYM(S) |
|---|---|
| | 11. SPONSOR/MONITOR'S REPORT NUMBER(S) |

| 12. DISTRIBUTION/AVAILABILITY STATEMENT **Approved for public release; distribution unlimited** |
|---|

| 13. SUPPLEMENTARY NOTES **The original document contains color images.** |
|---|

| 14. ABSTRACT |
|---|

| 15. SUBJECT TERMS |
|---|

| 16. SECURITY CLASSIFICATION OF: | | | 17. LIMITATION OF ABSTRACT | 18. NUMBER OF PAGES **6** | 19a. NAME OF RESPONSIBLE PERSON |
|---|---|---|---|---|---|
| a. REPORT **unclassified** | b. ABSTRACT **unclassified** | c. THIS PAGE **unclassified** | | | |

1. **Introduction**

Force XXI  - The Army of the 21st century is being fielded and tested at Fort Hood, Texas.  The first digitized division of the Army will be the 4th Infantry Division followed by the 1st Cavalry Division and concluding with the corps units of the III Corps.  This paper will describe the operational concepts of the new division and the supporting Army Battlefield Command System (ABCS).

2. **Operations**

The U.S. Army will redesign its operating forces to field a total Army force that is capable of meeting our Nation's 21st century challenges. Former Army Chief of Staff Gordon Sullivan set the U.S. on the path to Army XXI.  This force will be a knowledge and capabilities-based, power projection Army capable of land forces dominance across the continuum of 21st century joint military operations.  It supports the Joint Vision XXI by creating a Force XXI that will utilize the concepts evaluated in a series of experiments to include work at the National Training Center (NTC), Fort Hood Texas, and joint exercises with the Air Force and Marine Corps.  Additionally the Army has conducted live force on force exercises and command post exercises to understand and evaluate the effect of Information Technology on the commander's and staff as they operate on the battlefield.

The Army will field over 70 new systems in direct support of the first digitized division, 4th ID by 1 January 2000.  The four major systems that make up the digitization effort are:

1.  The new Abrams weapon systems,
2.  The new Bradley weapon system,
3.  Force 21 Battlefield Command and Control Systems - Brigade and Below, FBCB2,
4.  Army Battlefield Command and Control System, ABCS information systems

These four systems serve as the foundation of the digitalization effort. Other systems will follow including the Land Warrior, for the light forces and aviation and artillery systems as well as combat service support systems.  Early on, the Army recognized that the introduction of modern material, particularly that which directly impacted the execution of command and control and the way command posts functioned, would not be effective unless doctrine, organization, training, leadership and personnel issues were addressed. In short, the preceding experiments clearly identified the need for the Army to co-evolve organization and doctrine.

Without these changes, the revolutionary increases in combat power that vastly increased situational awareness promised would not be realized. While the material, particularly the M1A2SEP Abrams with the 120mm gun, 2nd generation FLIR, Under Armor, aux. power unit, and Force XXI Battlefield Command and Control System Brigade and Below, FBCB2 Digital C2, and M2A3 Bradley with the 25mm gun/TOW, Improved FLIR, Laser range finder and FBCB2 Digital C2weapon systems and the Army Battlefield Command and Control System, ABCS are the cornerstones of the first digitized division, the Army has recognized that the real power of advanced technologies cannot be translated into combat power unless it is integrated into the force. To answer this requirement the Army created a Digital Force Coordination Cell,

DFCC, at Fort Hood, Texas to ensure that the new weapon systems and information Systems were coordinated with Doctrine, Training, Leader Development, Organization, Materiel, and Soldiers or DTLOM-S. The DFCC is directly linked to the Training and Doctrine Command, TRADOC, and the first fielded unit, the 4th ID. As 1 January approaches, the DFCC provides a single point of contact for the Army to better understand the impact of the information age technology on the force.

Army Vision 2010, and the Army After Next, AAN provide the direction for the future. This direction can be summarized in the Force XXI enablers and the patterns of operations.
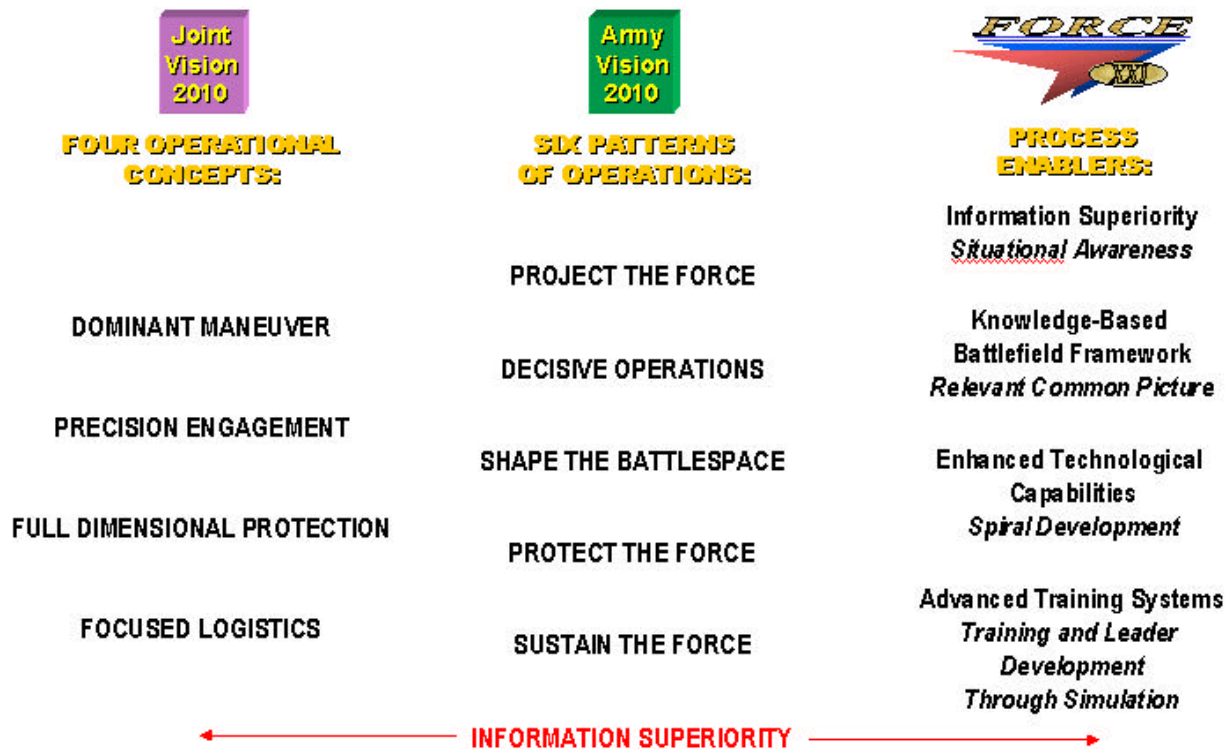The following are the Force XXI force enablers:

1. Information Superiority - Situational Awareness – Where am I, Where are my friends, Where are the enemy, and What is the environment.
2. Knowledge-Based Battlefield Framework –permitted by Relevant Common Picture
3. Enhanced Technological Capability
4. Spiral Development
5. Advanced Training Systems Training and Leader Development Through Simulation

These enablers support the five operational concepts of Joint Vision 2010:

1.  Precision Engagement - consists of a system of systems that enables joint forces to locate the objective or target, provide responsive command and control, generate the desired effect, assess the level of success, and retain the flexibility to reengage with precision when required.
2. Focused Logistics - consists of a fusion of information, logistics, and transportation technologies to track and shift assets even while en route, and to deliver tailored logistics packages and substainment at the tactical level of operations.
3. Full Dimensional Protection – consists of control of the battlespace to ensure our forces can maintain freedom of action during deployment, maneuver, and engagement while providing multilayered defenses for our forces and facilities at all levels.
4. Dominant Maneuver – is the multidimensional application of information, engagement, and mobility capabilities to position and employ widely dispersed land forces to accomplish assigned operational tasks.
5. Information Superiority - The capability to collect, process and disseminate an uninterrupted flow of information while exploiting or denying an adversary's ability to do the same. It includes paradigm shifts in the Intelligence Preparation of the Battlefield, IPB, which will permit a much higher level of knowledge of adversary's information systems as well as his operational intentions. Information Superiority has allowed new methods to template decision-making processes, analyze information infrastructure identify vulnerabilities, determine attack mechanism and entry point and conduct battlefield damage assessment.

## The Environment

**Joint Vision 2010**

**FOUR OPERATIONAL CONCEPTS:**

DOMINANT MANEUVER

PRECISION ENGAGEMENT

FULL DIMENSIONAL PROTECTION

FOCUSED LOGISTICS

**Army Vision 2010**

**SIX PATTERNS OF OPERATIONS:**

PROJECT THE FORCE

DECISIVE OPERATIONS

SHAPE THE BATTLESPACE

PROTECT THE FORCE

SUSTAIN THE FORCE

**FORCE XXI**

**PROCESS ENABLERS:**

Information Superiority
*Situational Awareness*

Knowledge-Based
Battlefield Framework
*Relevant Common Picture*

Enhanced Technological Capabilities
*Spiral Development*

Advanced Training Systems
*Training and Leader Development Through Simulation*

← INFORMATION SUPERIORITY →

These enablers provide support to the six Patterns of Operations:

1. Project the Force
2  Decisive Operations
3. Shape the Battlefield
4. Protect the Force
5. Sustain the Force
6. Information Superiority

The effect of these new operational concepts, enablers and patterns of operations permit the Army to: Conduct the Close Fight on its Own Terms, Maintain an Offensive Orientation and Do so with Smaller More Lethal organizations that fight differently. New operational concepts are being developed at the tactical area such as the digital line of departure and icon management. They have lead to tactical and operational considerations such as fewer reserves, new force ratios to determine when to relieve a unit in contact and new collaborations techniques that allow much better understanding of commander's intent. This major improvement in lessening the "fog of war" has lead to higher operational tempo. The Army has already recognized the power of increased SA and has reduced its heavy division structure. The Training and Doctrine Command, TRADOC, has conducted studies that conclude the following:

## Operational Gains of Digitization

*Based on Modeling & Simulation Results using Combined Arms and Support Task Force Evaluation Model (CASTFOREM), Janus and Janus Applique models.*

| | Before | After | Force Effectiveness Consequences |
|---|---|---|---|
| **Plan Development (Div)** | 72 Hours to Complete | 12 Hours to Complete | Increased OPTEMPO (6-fold) |
| **Call for Fire** | 3 Minutes to Complete | ½ Minute to Complete | Greater Lethality (10-fold) |
| **Deliberate Co Attack** | 40 Minutes to Initiate | 20 Minutes to Initiate | Increased OPTEMPO, Increased Lethality and Survivability (2-fold) |
| **\* Hasty Co Attack** | Red Loss-39 Blue Loss- 82 LER = .49 | Red Loss-112 Blue Loss- 92 LER = 1.24 | Increased OPTEMPO, Greater Lethality (2.5-fold) |
| **\* Defense in Sector** | Red forces penetrate Blue defense LER = 1.01 | Blue stops Red penetration LER = 2.45 | Increased Lethality and Survivability (2.5-fold) |
| **\* Movement to Contact** | Red Loss-91 Blue Loss- 80 LER = 1.10 | Red Loss-128 Blue Loss- 72 LER = 1.65 | Increased Lethality and Survivability (1.5-fold) |

*\* Task Force XXI AWE Integrated Report: Post-NTC Modeling of Opportunities*

Loss Exchange Ratio = # of red Losses/# of Blue Losses (Bigger is Better)

### 3. Support

The Army Battlefield Combat System, ABCS is changing the military decision making process. By allowing commanders and staff to share information, it is increasing Operational Planning / Operational Orders, Operational Tempo, Commanders Intent and the development of Courses of Actions (COA). The key to understanding the ABCS systems and their supporting communications systems is to think of them as a combination of communication and computational tools that link the vital command and control headquarters together. The effect on the military decision process that this linkage brings is to vastly increase the efficiency of the decision process.

This allows a greater operational tempo and more effective use of combat power. Through a series of experiments and exercises ABCS has demonstrated that commanders and staff enjoy a much higher order of organizational freedom - freedom to rapidly task organize utilizing the availability of timely and accurate information across and between echelons of command. This increased utilization allows units to increase their impact across the battlefield. Commanders have found that through the use of video and whiteboards they are able to decrease misunderstandings in both simple and complex combat operations. The use of collaborative planing tools such as video teleconferencing and the "John Madden" like white board with synchronized audio has allowed the sharing of the relevant common operating picture. This new

capability for the commander to "see" the battlefield may lead to the "staked helicopters" phenomenon as was experienced in Vietnam.  However, experiences in the recent exercises and experiments have not born this out.  Rather it has resulted in a freeing up of the subordinates and a resulting higher operational tempo. Of course any tool is subject to abuse and the Army must remain observant.

Another major improvement is the capability to share the relevant common tactical picture (CTP) between staffs at various echelons of command. This capability permits better and more rapid staff actions resulting in superior course of action analysis. This increase in staff efficiency has led directly to an increase in operational tempo.

The ABCS systems are under constant revision to make them easier for the staff and commanders to utilize and more efficient in terms of data replication and display.  Future versions of the ABCS display will mirror the Windows NT look and will have predetermined tabs.  Separate COAs in every functional area can be preset. For example the logistical annex can be worked, as the maneuver plan is being developed to prevent non-executable plans. Barrier plans and signal annex can be coordinated. One of the major innovations of the ABCS is the use of a Joint Common database. Each of the ABCS functional areas will contain as much as 80% of the data in each functional area. This permits the staffs to "see" and understand other functional areas. In the future the very nature of staff work and the training of the staff officers will change.